

IN THE CLAIMS:

1. (Amended) A method for genetically stabilizing an apomictic plant exhibiting genetic instability comprising producing [through chromosome doubling or B_{III} hybridization] a polyploid derivative line from said plant such that duplicate genes responsible for apomixis are isolated from each other on opposite homeologous genomes such that recombination is suppressed among homeologous genomes within the polyploid derivative line.

2. (Amended) A method for genetically stabilizing an apomictic plant exhibiting genetic instability comprising:

(a) producing [through chromosome doubling or B_{III} hybridization] a polyploid derivative line from said plant such that duplicate genes responsible for apomixis are isolated from each other by segmental allopolyploidy; and

(b) increasing fertility of said apomictic polyploid derivative line exhibiting segmental [allopolyploid] allopolyploidy by selfing or hybridizing with a similar plant to obtain sexually-derived progeny that express [, because of fortuitous recombinations, greater pollen fertility,] unreduced egg fertility [,] or parthenogenesis.

5. A method for genetically improving plants comprising:

(a) producing an apomictic plant, determining if said apomictic plant is genetically stable, and if said apomictic plant is unstable, then genetically stabilizing it to result in a genetically-stabilized derivative line;

(b) genetically enhancing said apomictic plant or genetically-stabilized derivative line, either of which is a facultative apomict, through plant breeding procedures where genetically divergent sexual or apomictic lines are hybridized with said apomictic plant or genetically-stabilized derivative line [or through genetic engineering procedures using transgenic constructs];

(c) breeding [or transforming] said plant, genetically-stabilized derivative line, or genetically-enhanced derivative line to include genetic material such that:

(i) female meiosis aborts resulting in essentially 100% apomictic seed formation [except in the optional case of an inducible down regulation of a transgenic promoter/gene construct, which gene construct causes meiotic abortion when expressed, such that facultative apomixis is expressed]; or

(ii) facultative apomixis occurs [except during an inducible up regulation of a transgenic promoter/gene construct that when expressed causes meiotic abortion resulting in essentially 100% apomictic seed formation].

Please add the following new claims:

15. (New) A method for genetically stabilizing apomixis in an interspecific hybrid plant exhibiting genetic instability for apomixis comprising producing an allopolyploid derivative line from said interspecific hybrid plant such that duplicate genes responsible for apomixis are isolated from each other on opposite homeologous genomes such that recombination is suppressed among homeologous genomes within the allopolyploid derivative line.

16. (New) A method for genetically stabilizing apomixis in an interracial or interspecific hybrid plant exhibiting genetic instability for apomixis comprising producing a segmental allopolyploid derivative line from said plant such that duplicate genes responsible for apomixis are isolated from recombination by segmental allopolyploidy.

17. (New) A method for genetically stabilizing apomixis in an apomictic intraspecific or interspecific hybrid plant or derivative line exhibiting genetic instability for apomixis comprising:

(a) producing a derivative line at an odd-numbered ploidy level such that female meiosis usually aborts resulting in essentially 100% apomictic seed formation; or

(b) breeding said plant such that female meiosis usually

aborts resulting in essentially 100% apomictic seed formation.

18. (New) A method for genetically improving plants comprising:

(a) obtaining or producing from sexual parent lines an apomictic plant;

(b) determining if said apomictic plant expresses apomixis at a near obligate level, and if said apomictic plant does not express apomixis at a near obligate level, then increasing apomixis fertility in said apomictic plant by selfing, or hybridizing said apomictic plant with a similar plant, to obtain sexually-derived progeny lines that express near-obligate frequencies of unreduced egg formation, parthenogenesis, and viable apomictically-produced seed formation;

(c) determining if said apomictic plant or near obligate derivative line is genetically stable for apomixis, and if said apomictic plant or near obligate derivative line is genetically unstable for apomixis, then genetically stabilizing it to result in a derivative line that is genetically-stabilized for apomixis;

(d) genetically enhancing said sexual parent lines, apomictic plant, near obligate derivative line, or genetically-stabilized derivative line through plant breeding procedures where genetically divergent sexual or apomictic lines are hybridized with said sexual parent plants, apomictic plant, near obligate derivative line, or

genetically-stabilized derivative line to produce a genetically enhanced derivative line;

(e) breeding said sexual parent plants, apomictic plant, near obligate derivative line, genetically-stabilized derivative line, or genetically-enhanced derivative line to include genetic material such that:

(i) female meiosis aborts resulting in essentially 100% apomictic seed formation; or

(ii) facultative apomixis occurs.